

## CLAIMS

1. An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

(a) a polynucleotide encoding amino acids from about 1 to about 115 of SEQ ID NO:2;

(b) a polynucleotide encoding amino acids from about 2 to about 115 of SEQ ID NO:2;

(c) a polynucleotide encoding amino acids from about 1 to about 115 of SEQ ID NO:4;

(d) a polynucleotide encoding amino acids from about 2 to about 115 of SEQ ID NO:4;

(e) the polynucleotide complement of the polynucleotide of (a), (b), (c), or (d); and

(f) a polynucleotide at least 90% identical to the polynucleotide of (a), (b), (c), (d) or (e).

2. An isolated nucleic acid molecule comprising about 345 contiguous nucleotides from the coding region of SEQ ID NO:1 or SEQ ID NO:3.

3. An isolated nucleic acid molecule comprising a polynucleotide encoding a polypeptide wherein, except for at least one conservative amino acid substitution, said polypeptide has an amino acid sequence selected from the group consisting of:

(a) amino acids from about 1 to about 115 of SEQ ID NO:2;

(b) amino acids from about 2 to about 115 of SEQ ID NO:2;

(c) amino acids from about 1 to about 115 of SEQ ID NO:4; and

(d) amino acids from about 2 to about 115 of SEQ ID NO:4.

4. The isolated nucleic acid molecule of claim 1, which is DNA.

5. A method of making a recombinant vector comprising inserting a nucleic acid molecule of claim 1 into a vector in operable linkage to a promoter.

6. A recombinant vector produced by the method of claim 5.

7. A method of making a recombinant host cell comprising introducing the recombinant vector of claim 6 into a host cell.

8. A recombinant host cell produced by the method of claim 7.

9. A recombinant method of producing a polypeptide, comprising culturing the recombinant host cell of claim 8 under conditions such that said polypeptide is expressed and recovering said polypeptide.

10. An isolated polypeptide comprising amino acids at least 95% identical to amino acids selected from the group consisting of:

- (a) amino acids from about 1 to about 115 of SEQ ID NO:2;
- (b) amino acids from about 2 to about 115 of SEQ ID NO:2;
- (c) amino acids from about 1 to about 115 of SEQ ID NO:4; and
- (d) amino acids from about 2 to about 115 of SEQ ID NO:4.

11. An isolated polypeptide wherein, except for at least one conservative amino acid substitution, said polypeptide has an amino acid sequence selected from the group consisting of:

- (a) amino acids from about 1 to about 115 of SEQ ID NO:2;
- (b) amino acids from about 2 to about 115 of SEQ ID NO:2;
- (c) amino acids from about 1 to about 115 of SEQ ID NO:4; and
- (d) amino acids from about 2 to about 115 of SEQ ID NO:4.

12. An isolated polypeptide comprising amino acids selected from the group consisting of:

- (a) amino acids from about 1 to about 115 of SEQ ID NO:2;
- (b) amino acids from about 2 to about 115 of SEQ ID NO:2;
- (c) amino acids from about 1 to about 115 of SEQ ID NO:4; and
- (d) amino acids from about 2 to about 115 of SEQ ID NO:4.

13. A composition comprising an isolated polypeptide comprising amino acids selected from the group consisting of:

- (a) amino acids from about 4 to about 50 of SEQ ID NO:2;
- (b) amino acids from about 9 to about 45 of SEQ ID NO:2;
- (c) amino acids from about 4 to about 50 of SEQ ID NO:4;
- (d) amino acids from about 9 to about 45 of SEQ ID NO:4; and
- (e) a polypeptide at least 86% identical to the polypeptide of (a), (b), (c), (d);

wherein the EGF receptor binding specificity has not been altered.

14. A composition comprising an isolated polynucleotide encoding a polypeptide of claim 13.

15. An epitope-bearing portion of a polypeptide selected from SEQ ID NO:2 or SEQ ID NO:4.

16. The epitope-bearing portion of claim 15, which comprises between about 10 and 100 contiguous amino acids of SEQ ID NO:2 or SEQ ID NO:4.

17. The epitope-bearing portion of claim 16, which comprises between about 12 and 50 contiguous amino acids of SEQ ID NO:2 or SEQ ID NO:4.

18. The epitope-bearing portion of claim 16, which comprises between about 15 and 25 contiguous amino acids of SEQ ID NO:2 or SEQ ID NO:4.

19. An isolated antibody that binds specifically to the polypeptide of claim 10.

20. An isolated antibody that binds specifically to the polypeptide of claim 11.

21. An isolated antibody that binds specifically to the polypeptide of claim 12.

22. A method for diagnosing a EGFH2 protein-modulated disorder using a biological sample from a human suspected of having said disorder, said method comprising :

- a) providing an antibody that binds to the polypeptide of claim 10;
- b) contacting the antibody with said sample under binding conditions to form a duplex; and
- c) determining the amount of said duplex formed, compared to a normal sample.

23. A method for diagnosing a EGFH2 protein-modulated disorder in a biological sample from a human suspected of having said disorder, said method comprising:

- a) providing a polynucleotide that binds to mRNA encoding the polypeptide of claim 10 under stringent conditions;
- b) contacting nucleic acid of said sample with said polynucleotide under binding conditions to form a duplex; and
- c) determining the amount of said duplex formed, compared to a normal sample.

24. A method for modulating the amount of a EGFH2 protein in a subject, said method comprising administering an effective amount of a composition selected from a group consisting of:

- a) the polypeptide according to claim 10; and
- b) an antibody that binds to the polypeptide of claim 10.

25. A method for modulating the amount of a EGFH2 protein in a subject, said method comprising administering an effective amount of a composition comprising the nucleotide sequence according to claim 1.

26. A method for treating a EGFH2 protein-modulated disorder in a subject, said method comprising administering to said subject an effective amount of a composition selected from a group consisting of:

- a) the polypeptide according to claim 10;
- b) an antibody that binds to the polypeptide according to claim 10; wherein said composition further comprises a pharmaceutically acceptable carrier.

27. A method for treating a EGFH2 protein-modulated disorder in a subject, said method comprising administering to said subject an effective amount of a composition consisting of the nucleotide sequence according to claim 1, wherein said composition further comprises a pharmaceutically acceptable carrier.

28. A method of providing trophic support for cells in a patient in need thereof, the method comprising administering to the patient a composition selected from the group consisting of a polynucleotide encoding an EGFH2 polypeptide comprising SEQ ID NO:2, a polynucleotide encoding an EGFH2 polypeptide comprising SEQ ID NO:4, and a polypeptide according to claim 10.

29. The method of claim 27 wherein said polynucleotide is administered by implanting cells which express said polynucleotide into the patient, wherein said cells express EGFH2 polypeptide in the patient.

30. The method of claim 29 wherein the implanted cells are encapsulated in a semipermeable membrane.

31. The method of claim 27 wherein the mammal suffers from a condition selected from the group consisting of breast cancer, prostate cancer, pancreatic cancer, oral cancer, ovarian cancer, peripheral neuropathy, amyotrophic lateral sclerosis, Alzheimer's disease, Parkinson's disease, Huntington's disease, ischemic stroke, brain injury, acute spinal cord injury, nervous system injury, multiple sclerosis, infection, dementia, epilepsy, peripheral nerve injury, acoustic trauma and tissue wound.

32. The method of claim 27, wherein the polynucleotide is an antisense construct.

33. The method of claim 27, wherein the polynucleotide is a ribozyme.

34. The method of claim 27, wherein the polynucleotide is a retroviral vector comprising a promoter.

35. A method of treating a patient with a EGFH2 protein-modulated disorder, the method comprising administering a composition comprising a therapeutically effective amount of polypeptides capable of binding EGFH2 or a variant thereof.

36. The method of claim 35, wherein the polypeptides are antibodies.

37. The method of claim 36, wherein the polypeptides are wild-type or mutant receptors for EGFH2.

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